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TUSKEGEE NORMAL AND INDUSTRIAL  
INSTITUTE

TUSKEGEE, ALA.

# Experiment Station

Experiments with Swing

G. W. OGDEN

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TUSKEGEE, ALA.  
Normal School Steam Press  
1899.



# Blount's Two-Horse Agricultural Experiment Station

## EXPERIMENTS WITH SWEET POTATOS

G. W. CARVER

As the question of potash, phosphate and other fertilizers is so much important to southern agriculturists, the Experiment Station of New York, very kindly donated one hundred pounds of each of the following amounts of fertilizers to be used on sweet potatoes:

Acid Phosphate	100 lbs.
Nitrate of Soda	100 lbs.
Muriate of Potash	100 lbs.
Sulphate of Potash	100 lbs.
Total	400 lbs.

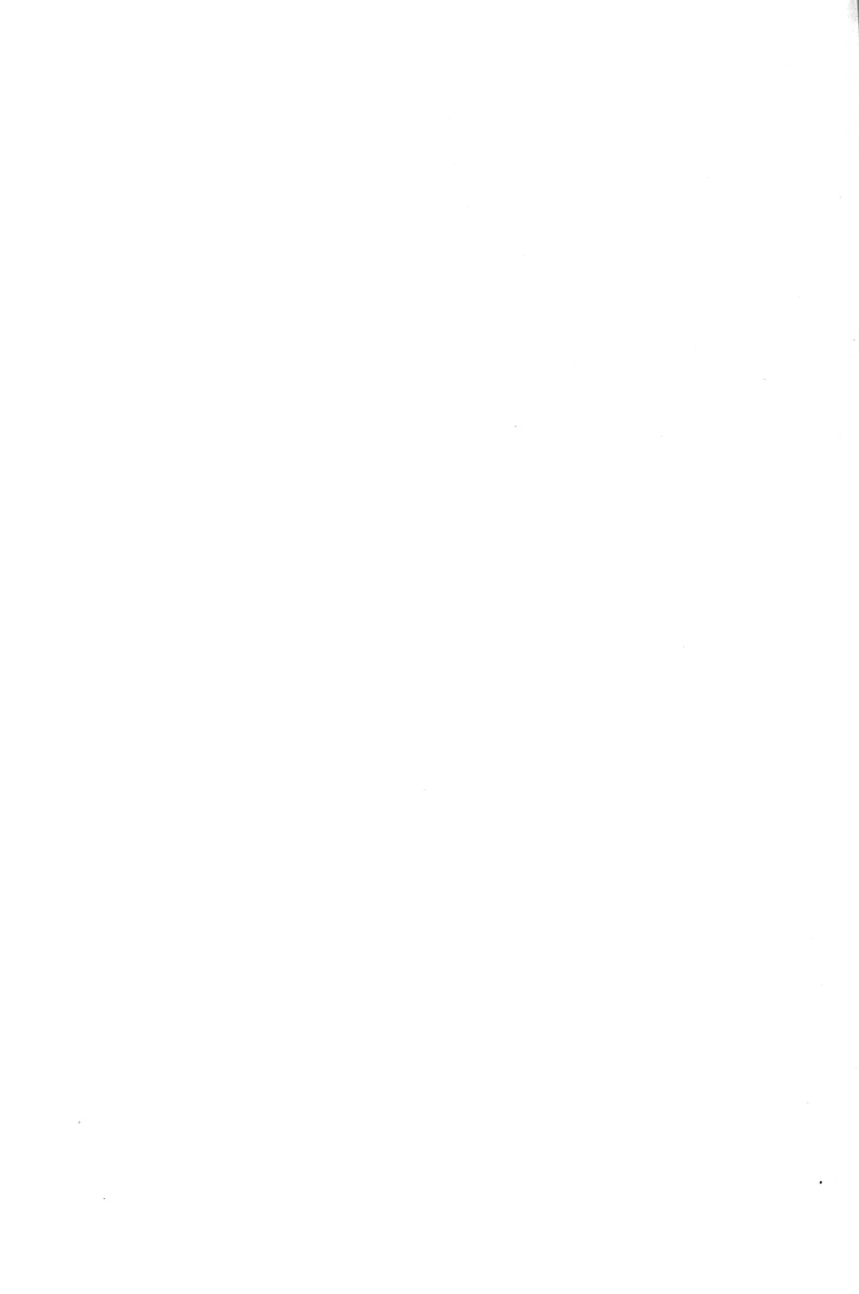
The soil used in this experiment was that of an old corn field, that had been "cropped" year after year under the old five tenant system, until it was deficient physically, and both mechanically and chemically. So much so that cow peas would not grow successfully upon it.

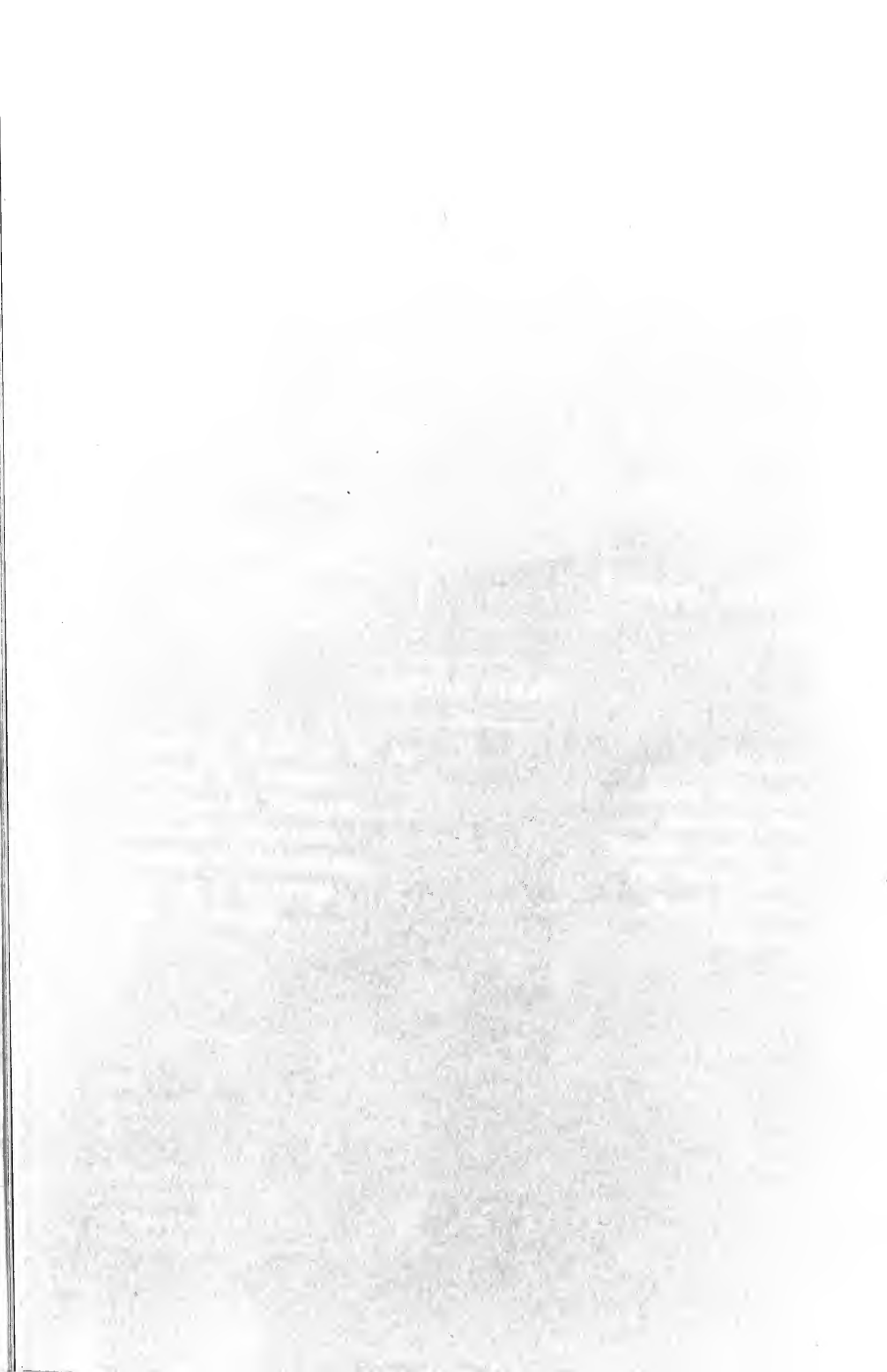
As to situation, it might be termed inland, dry, high and sandy in texture, with yellow clay sub-soil. There was a small excess of sand, which is favorable to the production of the sweet potato.

### PREPARATION OF THE SOIL

Blount's Two-horse Daisy Turning Plow was used and the earth turned upside-down (not set up on edge) to a depth of four or nine inches. A good harrow was now put upon it and it was harrowed both ways thoroughly; then re-plowed with a double-furrow plow, harrowed and re-harrowed, until practically every clod was mashed and a deep, mellow seed bed made.

This eight or nine inches of mellow soil permitted the roots to penetrate it quickly, and very materially increased the capacity for holding water, and almost completely overcame the danger of washes which are so frequent in soils of this character, resulting













The soil in the plots was of the same type, a heavy, dark, loamy soil, and was of the same depth, about 12 inches. The soil was plowed and harrowed in the usual manner, and the surface was leveled. This in preparation for the experiment. The soil was then covered (sowed) the same in the same manner. The ground was sufficiently covered to prevent the growth of weeds in plots 1, 2, 3 and 4. These might have been covered with a layer of straw without interference from weeds. It was found that more than one-third of the plot upon which they grew.

#### DESCRIPTION OF PLOTS

The plots were all one-tenth of an acre in size, and the amount of fertilizer indicated in the tables was applied to each. (See plots, pages 5 and 7.) Plants were set in each plot from another. The plowing, setting and harvesting were exactly the same for each plot. There were sixteen rows in each plot and sixty-five plants set in each row.



<p>1870</p>	<p>1871</p>	<p>1872</p>	<p>1873</p>
<p>1874</p>	<p>1875</p>	<p>1876</p>	<p>1877</p>
<p>1878</p>	<p>1879</p>	<p>1880</p>	<p>1881</p>
<p>1882</p>	<p>1883</p>	<p>1884</p>	<p>1885</p>
<p>1886</p>	<p>1887</p>	<p>1888</p>	<p>1889</p>
<p>1890</p>	<p>1891</p>	<p>1892</p>	<p>1893</p>
<p>1894</p>	<p>1895</p>	<p>1896</p>	<p>1897</p>



1a

200 lbs.

2a

60 lbs. Acid Phosphate  
 12 " Muriate of Potash  
 200 " Lime

3a

12 lbs. Muriate of Potash  
 20 " Nitrate of Soda  
 200 " Lime

4a

60 lbs. Acid Phosphate  
 20 " Nitrate of Soda  
 200 " Lime

5a

60 lbs. Acid Phosphate  
 12 " Muriate of Potash  
 20 " Nitrate of Soda  
 200 " Lime

6a

60 lbs. Acid Phosphate  
 24 " Muriate of Potash  
 20 " Nitrate of Soda  
 200 " Lime

7a

60 lbs. Acid Phosphate  
 24 " Sulphate of Potash  
 20 " Nitrate of Soda  
 200 " Lime

8a

200 lbs. Lime.





[illegible]

The patients were as small and infirm that 20 or 30 mg. of the

The more  $\beta$  (interest) is paid in the future, the less interest is paid in the present, and the lower the cost of borrowing.



The report of the committee on the use of fertilizers in the United States is a most interesting and valuable contribution to the knowledge of the subject. It is a most interesting and valuable contribution to the knowledge of the subject. It is a most interesting and valuable contribution to the knowledge of the subject.

In the usual course of the year, the soil is enriched with fertilizers. The amount of fertilizers used is almost equal to the amount of the crop. The amount of fertilizers used is almost equal to the amount of the crop. The amount of fertilizers used is almost equal to the amount of the crop.

It is also noticeable that no nitrogen was used in the year. The potatoes were of a fine, uniform quality. The potatoes were of a fine, uniform quality. The potatoes were of a fine, uniform quality.

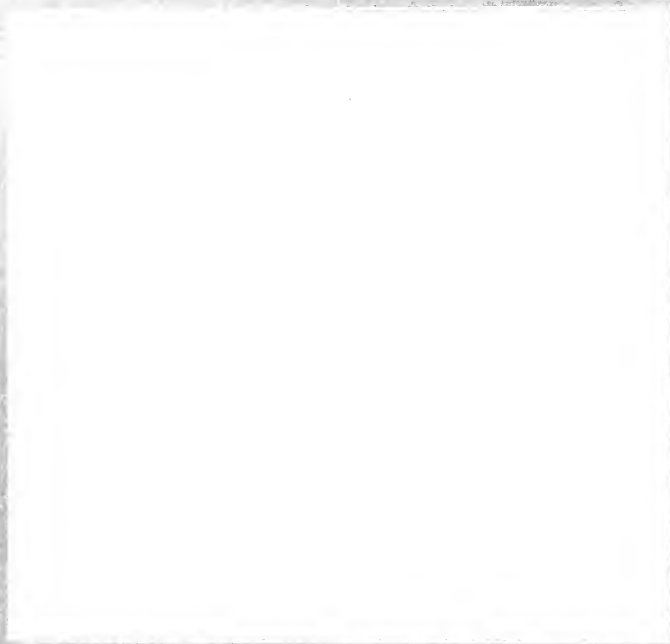
This is of special importance, when we consider that millions of pounds of some fertilizers are sold in the United States. The purchaser must pay 17 cents or more per pound of actual nitrogen purchased.

Neither owner nor renter can afford to apply any fertilizer to plant food where it is not needed, although much of it is done every year.

\*Note.—I am indebted to Mr. C. F. BARTON, of the U. S. Bureau of Plant Industry, for the following information: "The following is a list of the fertilizers used in the United States in the year 1900, in which a very large amount of fertilizers was used."



PLANT



NO FERTILIZER.

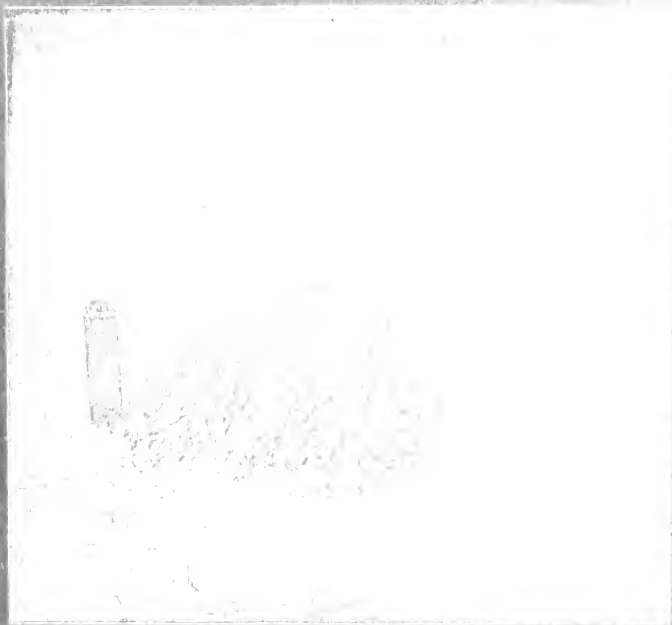
Yield 40 bushels per acre.

Sold for 25 cents per bushels--so inferior.

Net gain \$2.50.



PLOT 2



60 LBS. ACID PHOSPHATE.

12 " MURIATE OF POTASH.

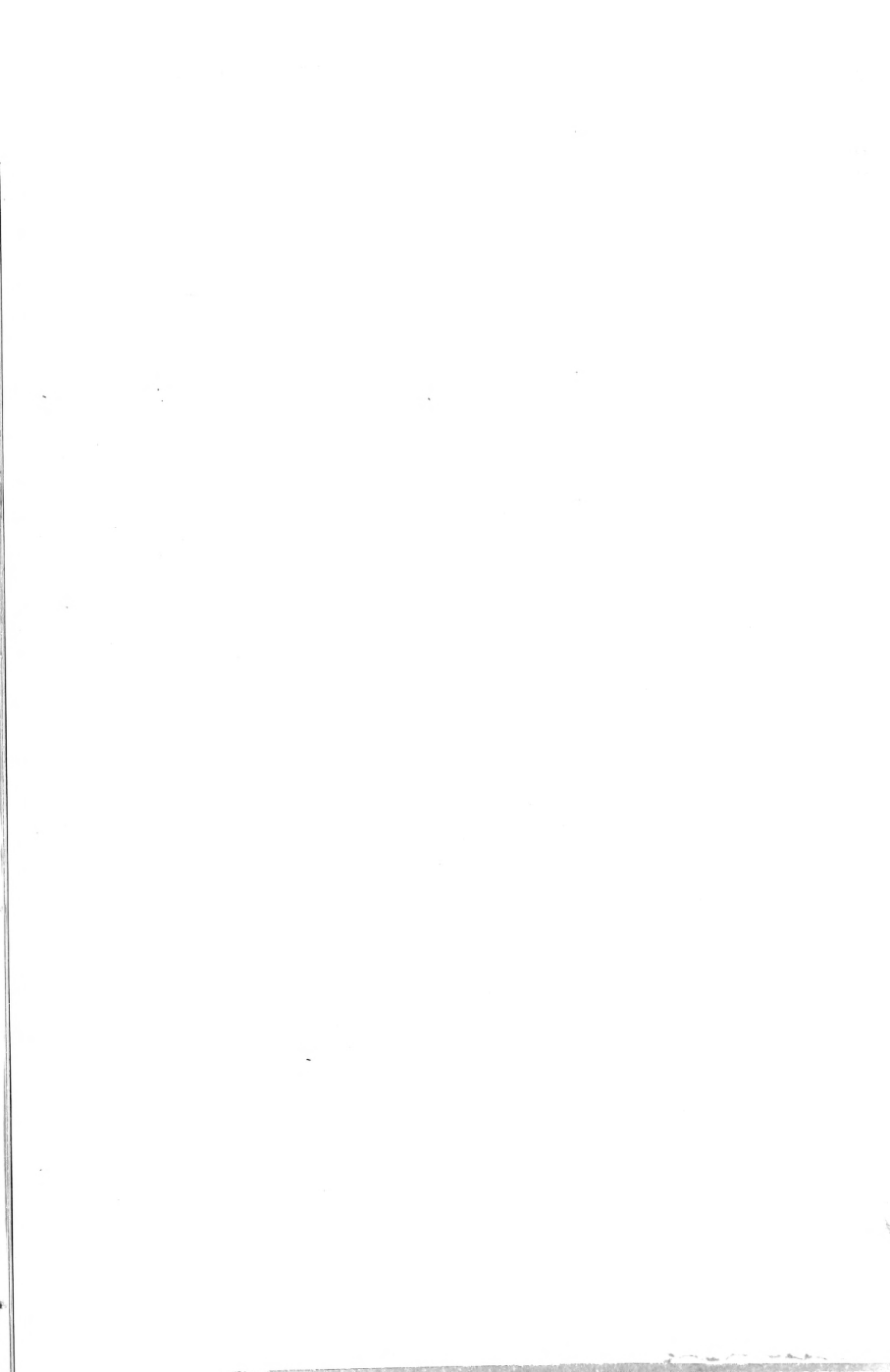
Yield 266 bushels per acre.

Sold at 50 cents per bushel.

Net gain \$121.80.40









FOOT 1

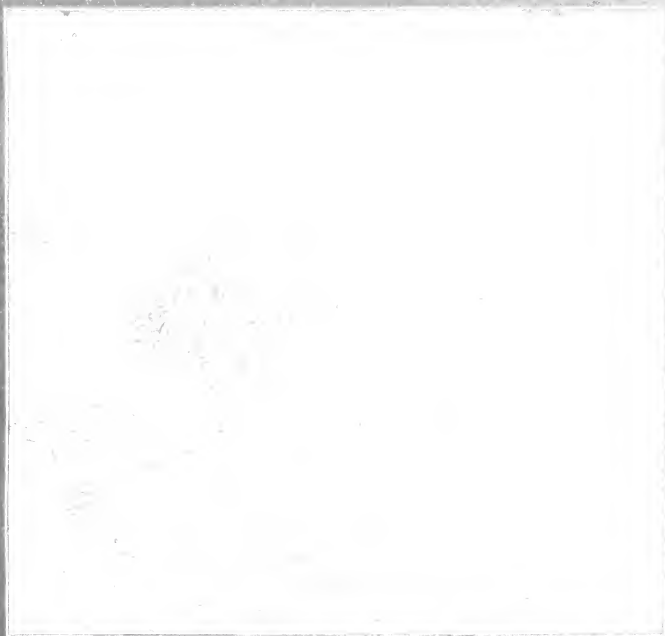
12 lbs. Muriate of Potash.  
20 " Nitrate of Soda.  
Yield 165.5 bushels per acre.  
Sold at 50 cents per bushel.  
Net gain ~~\$92.75~~ 68.75



It is almost the same as in Experiment 1. Compare the results of plots 1 and 2, the rate and amount of fertilizer used as lowly as possible for proper fertilization.

Plots 2, 1a and 2a are interesting and worthy of study (pages 12, 13 and 14.) Also note the kind, quantity and cost of fertilizers, and the amount made. You will, therefore, referring to page 8, that some of the plots had as much as \$50, \$50, \$50 and \$95 worth of fertilizers (estimated) put upon them; and by the minus sign before the number, the cost of production was that much greater than the product was worth. Plot 2.

### PLOT 1A.



60 lbs. Acid Phosphate.  
24 " Sulphate of Potash.  
20 " Nitrate of Soda.  
200 " Lime.

Yield 204 bushels per acre.  
Sold at 50 cents per bushel.

Net gain \$28.87. 100.77.



200 lbs. Lime.

Yield 95.5 bushels per acre.

Sold at 50 cents per bushel.

Net gain \$31.86, 32.86

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EXPLANATORY.

Since local conditions are so variable and such wide differences in the cost of transportation, nothing more than an approximate value can be placed upon the fertilizing materials upon the market.

As a rule, in and around Tuskegee, nitrogen, phosphoric acid and potash may be had at the following prices. (This is for high-grade fertilizers):

Nitrogen	16½ cents per pound.
Phosphoric Acid	5 " " "
Potash as Muriate	5 " " "
Potash as Sulphate	5 " " "

Note.—We are greatly indebted to the donors of the fertilizers for the five cuts.





And, last, but not least, I think it quite safe to say that the results of the experiment, 500 bushels per acre, are not far from the average yield of the best potato crops in the entire South, the average yield in this section being about 37 bushels per acre.

In summing up and drawing conclusions from the experiment, I think it quite safe to say that the following rules should be observed:

- First.—Abnormally poor soil, especially in the upland section, is the cause of the low yield.
- Second.—Owing to unavoidable reasons, the fertilizer should be applied at the right time, which is not always possible.
- Third.—The plants were set quite thick, and this was the cause of the low yield.
- Fourth.—The potato crop was practically a failure in the entire South; the average yield in this section being about 37 bushels per acre.

#### NOTE

This bulletin should be carefully studied by all who grow or expect to grow potatoes, and the following rules observed:

- (a) Prepare the ground well, by turning it over from eight to nine inches deep with a good two-horse plow, harrowing and pulverizing well.
- (b) Plant, practically flat, in dry soils, as high ridges dry out too quickly.
- (c) Fertilize well with potash and phosphates, using but little nitrogen; constantly remembering that the preparation of the soil and the after cultivation (which must be shallow) are quite as much to do with successful potato growing as the fertilizers used.
- (d) And that potash and phosphates are indispensable to the highest development of the potato and all root crops.
- (e) That our average upland soils will be benefitted by a light dressing of lime—say 200 pounds to the acre.
- (f) Sulphate of potash seemed to be of no special value over the muriate.
- (g) That heavy dressings of fertilizers containing nitrogen are not necessary.

